WE CLAIM:

1. A method of manufacturing a low loss optical waveguide having a high refractive index core, said method comprising the steps of:

forming a soot blank comprising Ta_2O_5 and SiO_2;

consolidating said soot blank to form a cane under conditions suitable to prevent crystallization in said blank; and

drawing said blank into an optical fiber.

2. The method as claimed in claim 1 wherein the step of consolidating said soot blank comprises the steps of:

exposing said soot blank to an atmosphere comprising helium; and

heating said soot blank to a temperature greater than 1550° C.

3. The method as claimed in claim 1 wherein the step of consolidating said soot blank comprises the steps of:

exposing said soot blank to a vacuum atmosphere, and

heating said soot blank to a temperature greater than 1450° C.

4. The method as claimed in claim 3 wherein the vacuum atmosphere comprises a pressure of less than about 10^{-4} torr.

5. The method as claimed in claim 2 wherein the atmosphere comprises helium and oxygen.

6. The method as claimed in claim 1 wherein the step of forming a soot blank comprises the step of doping said soot blank with between about 2.5 wt% Ta_2O_5 to about 3.5 wt% Ta_2O_5.

7. The method as claimed in claim 1 wherein said forming and consolidating steps comprise selecting parameters suitable to result in the optical fiber exhibiting a loss of less than about 1.8 dB/km at 1550 nm.

8. The method as claimed in claim 1 wherein said forming and consolidating steps comprise selecting parameters suitable to result in the optical fiber exhibiting a loss of approximately .25 dB/km at 1550 nm.

9. The method as claimed in claim 8 wherein the step of consolidating said soot blank comprises the steps of:

exposing said soot blank to an atmosphere comprising helium; and heating said soot blank to a temperature greater than 1550° C.

10. The method as claimed in claim 8 wherein the step of consolidating said soot blank comprises the steps of:

exposing said soot blank to a vacuum atmosphere; and heating said soot blank to a temperature greater than 1450° C.

11. The method as claimed in claim 1 further comprising the step of overcladding said blank to form a cladding comprising SiO_2.

12. The method as claimed in claim 1 wherein the step of forming said soot blank comprises the steps of:

flowing Cl_2 gas over Ta within a Cl_2 reactor at a temperature greater than 350° C to form $TaCl_5$;

delivering the $TaCl_5$ to an OVD burner to form soot comprising Ta_2O_5; and

depositing said soot on a rotating mandrel to form said soot blank.

13. An optical fiber made by the method of claim 1.

14. An optical fiber comprising;

a high purity glass cladding; and

a glass core bounded by said cladding, said glass core having a higher refractive index than said cladding, said glass core including between about 2-

5 wt% Ta_2O_5 after consolidation, and wherein light attenuation in said optical fiber is less than about 1.8 dB/km at 1550 nm.

15. The optical fiber as claimed in claim 14 wherein said glass core further includes SiO_2 and wherein said optical fiber is substantially free of crystals.

16. The optical fiber as claimed in claim 15 wherein light attenuation in said optical fiber comprises about 0.25 dB/km at 1550 nm.

17. A glass for use in the core of an optical waveguide comprising:

SiO_2; and

by weight on an oxide basis after consolidation, between about 2% non-crystallized Ta_2O_5 to 5% non-crystallized Ta_2O_5.

18. The glass as claimed in claim 17 wherein said core glass is consolidated in a helium atmosphere at a temperature of between about 1600° C to about 2000° C.

19. The glass as claimed in claim 18 wherein said core glass is consolidated in a helium atmosphere at a temperature of between about 1600° C to about 1800° C.

20. The glass as claimed in claim 19 wherein said core glass is consolidated in a helium atmosphere at a temperature of between about 1600° C to about 1650° C.

21. The core glass as claimed in claim 17 wherein said core glass is consolidated in a vacuum atmosphere at a temperature greater than about 1450° C.

22. The core glass as claimed in claim 17 wherein said core glass is bounded by a cladding comprising SiO_2 to form an optical fiber, and wherein light attenuation in said optical fiber is less than about 1.8 dB/km at 1550 nm.

23. The core glass as claimed in claim 22 wherein light attenuation in said optical fiber is less than 0.25 dB/km at 1550 nm.